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09/652,097	08/31/2000	Mark Richard Shaw	13DV13495	2850

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EXAMINER	
STEVENS, THOMAS H	

ART UNIT	PAPER NUMBER
2123	

DATE MAILED: 12/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/652,097	SHAW ET AL.	
	Examiner	Art Unit	
	Thomas H. Stevens	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 May 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-19 were examined.

Response to Applicants' Arguments

35 U.S.C. 112

2. The applicants are thanked for addressing this issue. Applicants' explanation of 'dynamic system operating inputs" in regard to claims 2, 4,16 and 17 is accepted; rejections are withdrawn. Rejection of claim 6 stands because of insufficient detail.

Applicants' state in the response stating that one of ordinary skill in the art would understand after reading the specification in view of the drawings. The examiner opposes the latter statement for reason being that no matter how obvious a simple or trivial fact is to one of ordinary skill, the background portion of the specification should disclose or derive, in this case, a stiffness multiplier. Rejection to claims 6 stands.

35 U.S.C. 101

3. The applicants are thanked for addressing this issue. Rejection is withdrawn.

35 U.S.C. 103

4. The applicants are thanked for addressing this issue. Examiner finds applicants arguments as non-persuasive. The examiner's reasoning was to encompass Rosemount's physical principles related to bellows into the model by I-DEAS Master

Series, which negates applicant's argument. Both pieces of art mention stiffness or maximum stiffness, whereas the applicants have not sited one example of how these stiffness multipliers are empirically found or list a process or procedure, numerically, nor provided any computer software or code related to its computation. Furthermore, applicant has admitted (pg. 7-8, lines 31-31 and 1-60) that Rosemount is pertinent to that "factors that should be considered in selecting a pressure transmitter for sue inside mechanical elements". The examiner's 103 rejection is proper in light of the scope of the claims. Rejection is denied.

Rejections

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claim1-19 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. The examiner has little evidence pertaining how, empirically, or computationally the stiffness multiplier is calculated.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

8. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention: The examiner fails to understand the purpose of this claim. If claim 5, for example, is to find the stiffness multiplier, isn't it inherent that one has found the stiffness of the system?

9. Regarding claims 14-19, the phrase "systems" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 103

10. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 1-19 are rejected under 35 U.S.C. 103 (a) as unpatentable by Rosemount™ Inc. (Technical Data Sheet "Pressure Fundamentals and Transmitter Selection" 1998), in view of Broman et al. ("Modeling Flexible Bellows by Standard Beam Finite Elements" 1999).

Rosemount™ Inc. teaches the fundamentals of pressure measurement as they relate to industry, and factors that should be considered in selecting a pressure transmitter inside mechanical elements (pg. 2, introduction; and pg. 5, bellow elements). Although, Rosemount teaches the applicable physics behind theses devices in relation to pressure flow, it doesn't teach applying these properties to modeling/simulation.

Broman et al. teaches modeling flexible bellows by standard beam finite elements by way of the *I-DEAS Master Series 6* modeling software (pg. 9, 4th paragraph, line 3).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to use Broman et al. to modify Rosemount™ Inc. since it would have been advantageous to model real-time events to confront and eliminate safety hazards due to the possibility of underestimating pressure states and natural frequencies values.

Claim 1: A method for predicting natural frequency (Rosemount: pg. 5, left column, 2nd paragraph & equation) responses said method comprising the steps of: providing at

least one tube sub-system including a plurality of shrouded bellows components; determining a stiffness multiplier within each of the shrouded bellows components from input values; using the determined stiffness multiplier in a model (Broman: title and pg. 18, lines 10-11) that applies a standard geometry element and flexibility factor based upon the stiffness multiplier to predict a natural frequency response, and determining location for duct supports.

Claim 2: A method in accordance with Claim 1 further comprising the step of inputting dynamic system operating inputs into the model (Broman: pgs 4-5, notations; and Rosemount: pg. 4, right column, 1st paragraph and 2nd paragraph, lines 9-12).

Claim 3: A method in accordance with Claim 2 wherein said step of inputting dynamic system (Broman: pgs 4-5, notations; and Rosemount: pg. 4, right column, 1st paragraph and 2nd paragraph, lines 9-12) operating inputs further comprises the step of inputting at least an operating pressure and vibratory environment into the model (Broman: pg. 24, paragraphs 2 and 3).

Claim 4: A method in accordance with Claim 2(Broman: pgs 4-5, notations; and Rosemount: pg. 4, right column, 1st paragraph and 2nd paragraph, lines 9-12) further comprising the step of inputting geometry (Broman: pgs 17, last two sentences; and pg. 18, figure 3.6) inputs including at least one of a bellows pitch and a mating tube diameter into the model.

Claims 5: A method in accordance with Claim 3(Broman: pgs 4-5, notations; and Rosemount: pg. 4, right column, 1st paragraph and 2nd paragraph, lines 9-12) wherein said step of determining a stiffness multiplier further comprises the step of using a regression technique to determine the stiffness multiplier (Rosemount: pg. 5, natural frequency equation; and Broman: pg 13, section 3.3 Axial Vibrations) based on dynamic stiffness test data.

Claim 6: A method in accordance with Claim 3 (Broman: pgs 4-5, notations; and Rosemount: pg. 4, right column, 1st paragraph and 2nd paragraph, lines 9-12)further comprising the step of determining system stiffness as a function of the stiffness multiplier (Rosemount: pg. 5, natural frequency equation; and Broman: pg 13, section 3.3 Axial Vibrations).

Claim 7: A modeling system for determining natural frequency response of shrouded bellows components, said system comprising a processor configured to determine a stiffness multiplier from input values(Rosemount: pg. 5, natural frequency equation, pg. 24, section 4.6 Summary of Modeling Procedure; and Broman: pg 13, section 3.3 Axial Vibrations).

Claim 8: A modeling system in accordance with Claim 7 wherein the stiffness multiplier is used to determine the natural frequency response (Rosemount: pg. 5, natural

frequency equation, pg. 24, section 4.6 Summary of Modeling Procedure, pg. 31 2nd paragraph; and Broman: pg 13, section 3.3 Axial Vibrations).

Claim 9: A modeling system in accordance with Claim 8(Rosemount: pg. 5, natural frequency equation, pg. 24, section 4.6 Summary of Modeling Procedure, pg. 31 2nd paragraph; and Broman: pg 13, section 3.3 Axial Vibrations) wherein the input values include at least one of shrouded bellows geometry inputs and dynamic operating condition inputs (Broman: pg. 31-35, section 4.7.2, Specimen from Ting-Xin et al.).

Claim 10: A modeling system in accordance with Claim 8(Rosemount: pg. 5, natural frequency equation, pg. 24, section 4.6 Summary of Modeling Procedure, pg. 31 2nd paragraph; and Broman: pg 13, section 3.3 Axial Vibrations) wherein the bellows geometry inputs include at least one of a tube (Bronman: pg. 18, 2nd paragraph and figure 3.6) sub-system diameter and a bellows pitch.

Claim 11: A modeling system in accordance with Claim 8(Rosemount: pg. 5, natural frequency equation, pg. 24, section 4.6 Summary of Modeling Procedure, pg. 31 2nd paragraph; and Broman: pg 13, section 3.3 Axial Vibrations) wherein the dynamic operating condition inputs include at least an operating pressure (Broman: pg.26, section 4.7.1, Geometry and material properties (*E*)).

Claim 12: A modeling system in accordance with Claim 8 (Rosemount: pg. 5, natural frequency equation, pg. 24, section 4.6 Summary of Modeling Procedure, pg. 31 2nd

paragraph; and Broman: pg 13, section 3.3 Axial Vibrations) wherein the stiffness multiplier is adjustable such that a dynamic stiffness of the shrouded bellows is selectively variable.

Claim 13: A modeling system in accordance with Claim 8(Rosemount: pg. 5, natural frequency equation, pg. 24, section 4.6 Summary of Modeling Procedure, pg. 31 2nd paragraph; and Broman: pg 13, section 3.3 Axial Vibrations) wherein the stiffness multiplier determined using a regression technique.

Claim 14: A system for determining natural frequency response of shrouded bellows components, said system comprising a model configured to predict the natural frequency response as a function of a stiffness multiplier (Rosemount: pg. 5, natural frequency equation, pg. 24, section 4.6 Summary of Modeling Procedure, pg. 31 2nd paragraph; and Broman: pg 13, section 3.3 Axial Vibrations).

Claim 15: A system in accordance with Claim 14 wherein said model further configured to determine the stiffness multiplier from input values (Rosemount: pg. 5, natural frequency equation, pg. 24, section 4.6 Summary of Modeling Procedure, pg. 31 2nd paragraph; and Broman: pg 13, section 3.3 Axial Vibrations) (Broman: pg. 31-35, section 4.7.2, Specimen from Ting-Xin et al.).

Claim 16: A system in accordance with Claim 15 (Rosemount: pg. 5, natural frequency equation, pg. 24, section 4.6 Summary of Modeling Procedure, pg. 31 2nd paragraph; and Broman: pg 13, section 3.3 Axial Vibrations) (Broman: pg. 31-35, section 4.7.2, Specimen from Ting-Xin et al.) wherein the input values include at least one of shrouded bellows geometry inputs and dynamic operating condition inputs, the shrouded bellows geometry inputs including at least one of a tube sub-system diameter and a bellows pitch, the dynamic operating condition inputs including at least an operating pressure.

Claim 17: A system in accordance with Claim 14 wherein the stiffness multiplier is adjustable such that a dynamic stiffness of the shrouded bellows is selectively variable.

Claim 18: A system in accordance with Claim 14 (Rosemount: pg. 5, natural frequency equation, pg. 24, section 4.6 Summary of Modeling Procedure, pg. 31 2nd paragraph; and Broman: pg 13, section 3.3 Axial Vibrations)wherein the stiffness multiplier determined using a regression technique (Broman: pg. 25, line 11).

Claim 19: A system in accordance with Claim 18 wherein the regression technique comprises a regression equation (Rosemount: pg. 5, natural frequency equation, pg. 24, section 4.6 Summary of Modeling Procedure, pg. 31 2nd paragraph; and Broman: pg 13, section 3.3 Axial Vibrations) (Broman: pg. 31-35, section 4.7.2, Specimen from Ting-Xin et al.).

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Correspondence Information

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom Stevens whose telephone number is (703) 305-0365, Monday-Friday (8:30 am- 5:30 pm) or contact Supervisor Mr. Kevin Teska at (703) 305-9704. The fax number for the group is 703-872-9306.

Any inquires of general nature or relating to the status of this application should be directed to the Group receptionist whose phone number is (703) 305-3900.

December 10, 2004

THS

KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER